

Quality Management

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Cost of Quality Revisited

Nearly 50 years ago, a new concept was introduced into quality management: the cost of quality. For many years, this concept has been used to identify opportunities for significant savings. Increasingly, though, leading quality professionals argue that the original ideas have outlived their usefulness and it is time we rethought the whole idea.

Two basic ideas have been used for these many decades. The first is the idea of an optimum quality level, which is the point when total quality costs are minimized. The second is the characterization of quality costs into four parts: prevention, appraisal, internal failure and external failure.

In the early 1980s, researchers like Bruce Hoadley at Bell Laboratories began questioning the notion of optimum quality levels. Hoadley and many others, including myself, had discovered too many examples whereby changing the process radically changed the basic shape of the cost curves and moved the optimum point dramatically.

For example, by implementing modern statistical quality control methods on the production line and reducing much of the costly (and often ineffective) final inspection, we could produce higher quality output at lower costs.

Many people began questioning whether we shouldn't put our energies into changing the curves rather than trying to find the elusive minimum points. In 1985, Professor Hitoshi Krrme of the University of Tokyo stated that in the numerous Japanese companies studied, the only ones worried about this classic approach to quality costs were divisions of U.S. companies. The Japanese companies focused instead on finding

ways to improve quality while reducing costs.

A second breakthrough in our thinking came when we realized [that we could also change the costs of failures. Although this was not a new idea, in the 1980s companies began to rigorously look for ways to reduce costs associated with each failure. By making products easier to maintain or repair, the cost of each failure could be drastically cut.

The concept of characterizing quality costs into four parts has also come under fire. Not long ago, brilliant German quality pioneer Walter Massing chaired a special task force of the International Academy of Quality to review the basic ideas of cost of quality. At the European Organization for Quality's Annual Conference in 1990, he reported some of their findings.

The first problem is the term itself. Since quality is so integral to goods or services, how do we separate [the costs of achieving quality from the cost of producing goods or services? The modern approach has been to concentrate on [the "price of nonconformance" (Crosby) or the "costs of poor quality" (Juran). But the real problem, Massing explains, is that trying to minimize the so-called quality costs misses the main issue. What we want to minimize is the entire cost of production, not one subset of costs.

This approach has an even larger problem: defining prevention costs. Every company does numerous things to prevent failures, from market research to design to choice of suppliers to production techniques and even employee training.

"If all these items were put under the heading 'Prevention Cost,' it would soon

become apparent that almost all of the total cost of running the company comes under failure prevention," explains Massing. The only viable policy is to concentrate on failure costs and to justify prevention measures for one problem at a time, he notes.

During my days at Bell Labs, we developed an approach to cost of quality that avoids many of the problems of definitions and accounting nightmares. We called it the "golden line." We would simply walk the line, making estimates of [true production costs using rough estimates of labor costs, materials and finished goods inventories, rework, inspection and so forth.

From this simple estimate, we would subtract the theoretical costs of production. What if the world were perfect? What if we had no redesigns and each design resulted in a product that was produced and sold? What if we needed no inspection anywhere, all purchased goods were perfect, all assemblies were perfect and we never even had a solder touch up? By looking at the theoretical minimum compared to the actual costs, we often identified major opportunities that had never been seen before.

I would recommend this approach as a starting point for every organization. Next month, I'll cover some other ideas that are having major payoffs in reducing "costs of poor quality."

About the author,...

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